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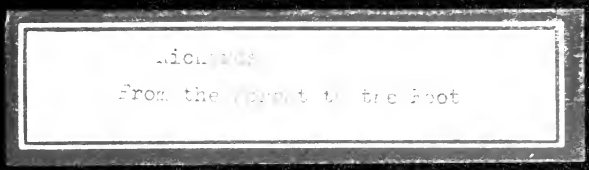

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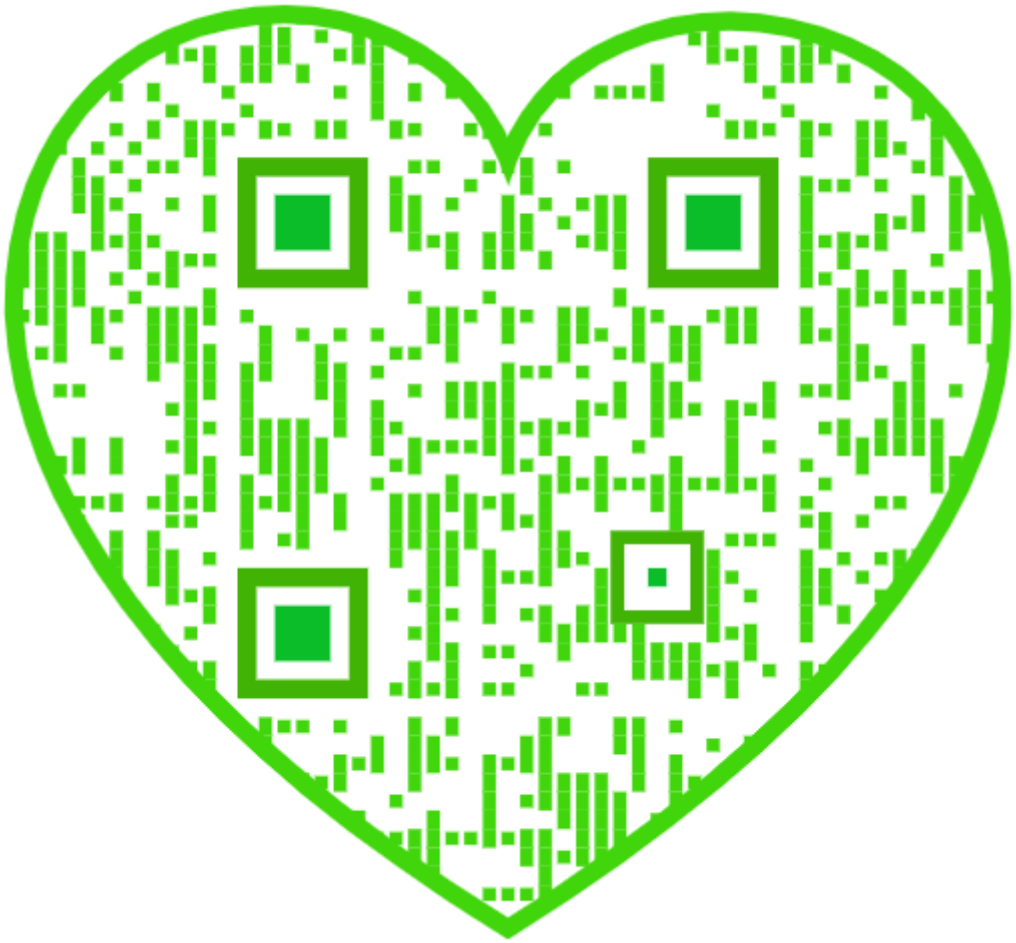

FROM
FOREST
TO
FOOT
The World's Fair
Souvenir

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FROM THE FOREST TO THE FOOT

BOSTON
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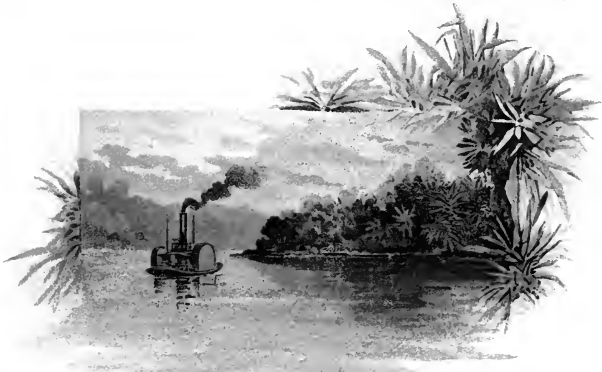


DOWN THE AMAZON TO PARA.

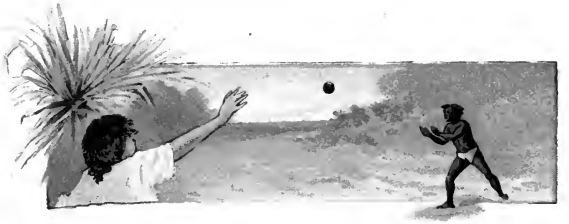
FROM THE FOREST TO THE FOOT.

"GOD bless the man who invented sleep!" exclaims Don Quixote's faithful but drowsy servitor, and it is easy to imagine any man who reaches shelter from the shifts and rigors of our Northern winter breathing with no less devoutness: "God bless the man who invented rubber, and especially rubber shoes!" Strictly speaking, rubber was not invented, of course, being a natural product, but in those qualities which multiply its serviceableness to man it owes as much, if not more, to human genius than to Nature.

Let us imagine that the first snow of the winter

has fallen and that the reader has struggled homeward on a dark night through three or four inches of slush, the brownish-gray mixture into which first snow so often transforms itself. Being a prudent man and, as such, provided with "rubbers," he reaches his household dry-shod and in a temper to enjoy the evening indoors. Curtains are drawn and a chair is placed within the zone of warmth diffused by a fire of crackling logs, hickory or maple, which he, with the consciousness of doing one thing superlatively well, has built himself. Suppose, then, that he should give a thought to that pair of rubber shoes which has been of so much service to him. His thought takes him much further afield, and into more varied scenes, than a hasty observer would believe, and, bit by bit, he finds the story of the discovery of rubber and the utiliza-

tion of it for man's benefit unfolding itself with more interest than the novel lying unread in his lap. As in a panorama, picture after picture grows before him, now in tropical groves and by the sluggish flow of Brazilian rivers, now of dark laboratories, in the vapor of which weary inventors are struggling to entice from Nature some secret which she refuses to reveal; now in enormous factories in which, with marvelous rapidity and by the most perfect processes, a vegetable exudation is converted into the most indispensable article of civilized clothing. He sees, too, in all its pathos of inalienable purpose, unswerving endeavor and unceasing toil, the life of the man who, by unparalleled perseverance, at last compelled Nature to give up that which had so long been hidden in her bosom.

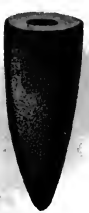


THE DISCOVERY OF RUBBER.

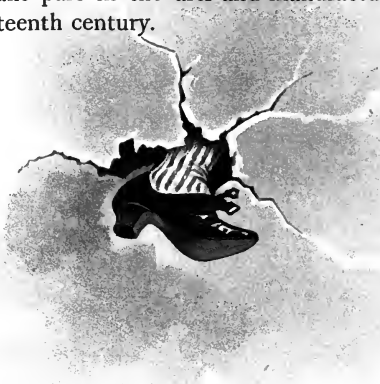
THE existence of rubber and a knowledge of its peculiar and useful properties must have been known to the Mexican Indians many years before its discovery by the whites. The first mention of it was made by Herrara in his account of the second voyage of Columbus, wherein he speaks of a ball used by the Indians made from the gum of a tree, which was lighter and bounced better than the far-famed wind balls of Castile. Torquemada, writing half a century later, also speaks of rubber which he found used by the natives as a remedial agent in

cases of hemorrhages and similar diseases. Mixed and drunk with cocoa, it made an excellent healing emollient for the lungs, and applied externally it possessed properties of special value in removing tightness of the chest. So, at its earliest introduction, we find rubber administering to the wants of man, both in his idle moments and when he sought relief from suffering.

The first accurate information regarding this wonderful plant was furnished by La Condamine, a French scientist who was sent in 1735 by his Government to measure an arc of the meridian near Quito. This brought him to the heart of the rubber-growing section, and much valuable information was the result. Nevertheless, rubber remained practically unknown, except as a curiosity, for many years after, and it was near the close of the eighteenth century when Dr. Priestly, in a preface to his work on Perspective, called public attention to it as "a novelty for



erasing pencil marks," stating that "it is sold in conical pieces of half an inch for three shillings each." For this purpose it was imported into England, but it found no particular sphere of usefulness, beyond the modest requirements of artists, till about 1820, nearly three hundred years after its first introduction to civilization. The successful manufacture of surgical instruments was then accomplished, and a suspicion of the wonderful capacities of this strange, new product began to suggest itself, and the world of commerce awoke to the fact that a new force had entered the industrial field, that was destined to play an important part in the arts and manufactures of the nineteenth century.



DISCOVERY OF VULCANIZING.

AT this point the inventor comes on the scene —to whom reference has already been made — Charles Goodyear. Various attempts had been made to use rubber for clothing, for shoes, coats and hats, but they had not been successful. Daniel Webster used to tell of a rubber cloak and hat which a New York friend had sent to him at Marshfield. He took the cloak to the piazza one cool morning, when it instantly became as rigid as sheet iron. Finding that it stood alone, he placed his hat upon it and left the articles standing near the front door. Several of his neighbors who passed, seeing a dark and portly figure there, took it, as Mr. James Parton

tells in an excellent story, for the lord of the mansion and respectfully saluted it. But the things that became as inflexible as ice with cold changed with heat to the consistency of molasses. When, at the advent of winter, you went to look for the shoes that you had put away in the spring, all you could find was a shapeless lump of something which resembled pitch. Some decorous gentlemen among us, adds Mr. Parton, can remember that in the nocturnal combats of their college days a flinty rubber shoe in cold weather proved highly efficacious as a weapon.

How could this material, which promised so much through its waterproof quality, be combined with ingredients that would prevent it from hardening with the cold or softening with the heat? That was the question which Charles Goodyear set himself to solve, the question that confronted him with the wolf of starvation, the taunts of friends and the bitterest disappointment at the moment when his ear seemed to catch the long-deferred answer. When the answer eventually came, Goodyear told of his struggles in a

book made of rubber — a volume of six hundred and twenty pages, with covers of rubber and pages of rubber, no other material about it, inside or out, than rubber, which changed neither with heat nor cold, and possessed all the properties which had hitherto been wanting. It cost him two millions of dollars to learn the secret, and the annals of invention contain no greater instance of heroic devotion and unfaltering hope than is afforded in the many links in the chain of experiments by which he finally triumphed. As he failed again and again, his friends forsook him; he was imprisoned for debt, and within the walls of the prison still continued his experiments. Often the secret seemed to be within his grasp, but as he reached for it, it would evade him. Once it occurred to him that perhaps it was the turpentine used in dissolving the gum or the lampblack employed to color it that spoiled his product. He esteemed it a rare piece of luck to procure some of the sap not smoked and still liquid. On going to the shed where the precious sap was deposited, he was accosted by an Irishman in his employ, who in high glee informed him that he had discovered the secret, pointing

to his overalls, which he had dipped into the sap and which were nicely coated with firm India rubber. For a moment he thought that Jerry might have blundered into the secret. The man, however, sat down on a barrel near the fire, and, on attempting to rise, found himself glued to his seat and his legs stuck together. He had to be cut out of his overalls.

It was an accident at last that opened the way to discovery of the process of vulcanization for which Goodyear was seeking. At Woburn one day, in the spring of 1839, he was standing with his brother and several other persons near a very hot stove. He held in his hand a mass of his compound of sulphur and gum, upon which he was expatiating in his usual vehement manner — the company exhibiting the indifference to which he was accustomed. In the crisis of his argument he made a violent gesture which brought the mass in contact with the stove, which was hot enough to melt India rubber instantly; upon looking at it a moment after, he perceived that his compound had not melted in the least degree!

It had charred as leather chars, but no part of the surface had dissolved. There was not a sticky place upon it. To say that he was astonished at this would but faintly express his ecstasy of amazement. The result was absolutely new to all experience — India rubber not melting in contact with red-hot iron! He felt as Columbus felt when he saw the land bird alighting upon his ship and the driftwood floating by. In a few years more his labors were crowned with success. In the words of Mr. Parton, who has kindly placed his researches at our disposal, Goodyear gave to the arts not a new material merely, but a new class of materials, applicable to a thousand diverse uses. His product had more than the elasticity of India rubber, while it was divested of all those properties which had lessened its utility.

RUBBER BISCUIT.

It was still India rubber, but its surfaces would not adhere, nor would it harden at any degree of cold nor soften at any degree of heat. It was a cloth impervious to water. It was paper that would not tear. It was parchment that would not crease. It was leather which neither rain nor sun would injure. It was ebony

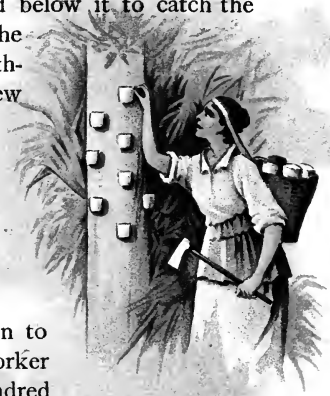
that could be run into a mold. It was ivory that could be worked like wax. It was wood that never cracked, shrunk, nor decayed. It was metal, "elastic metal," as Daniel Webster termed it, that could be wound round the finger or tied into a knot, and which preserves its elasticity almost like steel. Trifling variations in the ingredients, in the proportions and in the heating made it either as pliable as kid, tougher than ox hide, as elastic as whalebone or as rigid as flint. The increase in the value of the crude material and the importation of it can well be imagined.

GROTESQUE FORMS IN WHICH RUBBER SOMETIMES COMES.

THE HOME OF THE RUBBER GATHERER.

THE scenes that surround the home of the rubber gatherer on the Amazon are weird in the extreme. Think of a forest whose silence is unbroken by the voice of man, where even the sunshine refuses to penetrate, and all is dark, gloomy and foreboding. Fierce jaguars, deadly serpents, birds of brilliant plumage and the rubber gatherer are the sole tenants. In a small, thatched hut, built on piles — for his rude cabin nearly always stands in the water — is the dwelling place of the half Indian, half negro who taps the rubber tree. Close by is the rubber grove, and thither the worker wends his way at daybreak to gather the precious gum. With a small, sharp instrument, somewhat resembling a hatchet, an

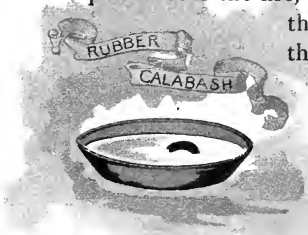
incision is made in the tree and a diminutive earthenware cup is placed below it to catch the flow. In many respects the operation is akin to the gathering of maple-sap in New England. The sap from the rubber tree flows into the cup and at night the entire yield is gathered into one huge earthenware jug or calabash and brought to the huts. Some trees yield from ten to thirty cups, and one worker may attend from one hundred and ten to one hundred and forty trees, so that a day's work is apt to be highly remunerative.



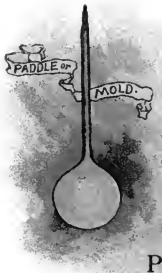
The contents of the calabash now resembles a huge pan of milk, and to make from this the crude rubber requires a skillful and peculiar manipulation, preparations for which have been going on meanwhile.

A smoldering fire of palm nuts is ready, the smoke from which transforms the gum into crude rubber. To concentrate this

smoke a jug-shaped earthenware vessel, constructed to answer the purpose of a chimney, is placed over the fire, and through the orifice pours the dense smoke caused by the burning palm nuts.



Fancy a man sitting in a small hut, with no ventilation, and this thick, heavy smoke filling the atmosphere! A white man would suffocate in a few moments, but the rubber smoker goes on, oblivious to his surrounding discomforts. He now takes an implement much resembling a long-handled wooden spade, the blade being round instead of square. Dipping this in the gum, he holds it over the smoke till the discoloration is complete; he then repeats this operation again and again till the requisite thickness is obtained. When sufficiently thick, the mass is cut from the mold and sold to traders, who take it down the river in small boats and canoes. From whatever cause, the rubber thus prepared is the finest in the world. Rubber is grown in Africa, Asia,



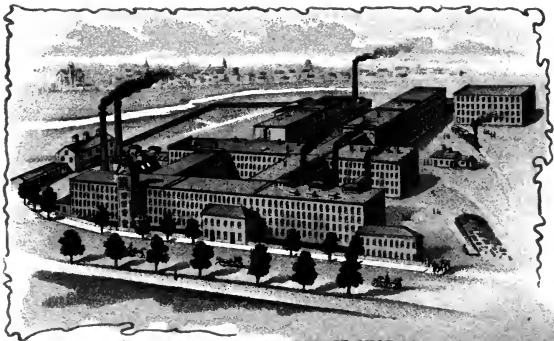
Assam, India, Singapore, Central and South America, but only on the Upper Amazon is the finest grade of rubber produced.

Down the stream go the lumps of crude rubber or biscuits, as they are called, and they finally reach Para, the chief city on the Amazon.

Para is the great rubber city of the world. It is also the headquarters for all goods coming and going on the Upper Amazon. It is a quaint half Portuguese, half Brazilian town, with long rows of low, flat, white houses, with red roofs, and derives its chief importance from its connection with the rubber groves. Its society is strictly divided into two classes—the merchants and the natives. Most of the merchants are Portuguese, English or American. They entertain with characteristic Southern hospitality, and do what they can to reduce the friction of

business to the minimum. During the heat of the day the merchant retires to his home in the suburbs and takes a short siesta. At four o'clock he returns to business, the heat being on the decline. There is none of that bustle common to American cities, and matters move along in a humdrum sort of a way that would simply torture the active Yankee.

Leaving Para, the rubber is soon on its way to New York, where swift-sailing steamers quickly land it, and now begin the operations that transform raw rubber into rubber boots and shoes.



FACTORY NO. 1, BOSTON RUBBER SHOE CO.

PROGRESS.

IF Charles Goodyear were alive to-day he could discover nothing connected with his invention in which so great an improvement has been made as in the manufacture of rubber shoes of the best quality. In shape, durability, and comfort there is no comparison between those experimented on by him and those which are now shipped to every city, town and village in the United States and to all parts of the world by the Boston Rubber Shoe Company. The most dainty Parisian fashions in footwear are reproduced in rubber with such perfection that the material has the appearance of the finest patent leather.

"How many styles do you make?" the writer of this souvenir had occasion to ask one of the officials of the Boston Rubber Shoe Company, and, to his amazement, the reply was, "Over one thousand styles and widths."

"How many pairs a day?"

"Oh, about forty-five thousand."

Forty-five thousand pairs a day!

Nine million pairs a year!

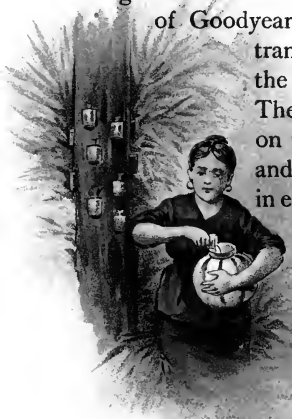
A hurried calculation shows that if this number of shoes were put toe to heel they would reach from New York City to Lisbon, Portugal.

Packed in cases, each one foot deep, they would cover thirty acres—would make seven Bunker Hill Monuments, and would fill 900 freight cars.

The Boston Rubber Shoe Company is the greatest producer of rubber boots and shoes in the world, and our contemplative friend who sits before his fire must visit, in his mind's eye, at least, such an establishment before his panorama is complete. He has seen the early

MAKING RUBBER SHOES.
(Taken from life.)

voyageurs pondering over the gum for which the savage found so many uses; he has had a glimpse of Goodyear's persistent toils, and of the transportation of the rubber down the Amazon and on the Atlantic. The last scene is in New England, on the edge of Middlesex Fells, and in a group of factories which in extent and equipment are without rivals.



The making of a rubber shoe is not the commonplace affair that might be supposed. It takes "nine men to make a pin," they say, but to make a rubber shoe it requires many more. There are washers, grinders, sheeters, cutters, makers, varnishers, vulcanizers, strippers, inspectors, packers and shippers engaged on every pair of shoes manufactured!

The crude rubber goes first into the hands of the grinder, who places the huge leathery biscuits in the jaws of ponderous cylinders that quickly grind them up. It comes out, no

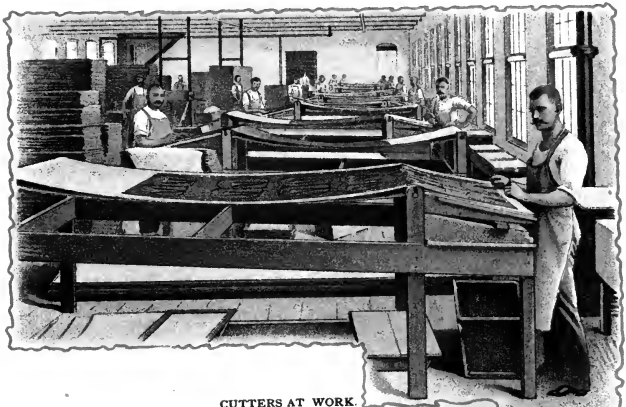
longer in balls, but in huge lumpy sheets, like the unwashed fleece of a sheep. These sheets go to the drying room to remain about a month, only to be again run through huge steel rollers, from

FIRST PROCESS.—GRINDING CRUDE RUBBER.

which they come out much thinner and smoother. They are then run through a set of rollers together with a web of cloth, making the rubber fabric from which boots and shoes are constructed.

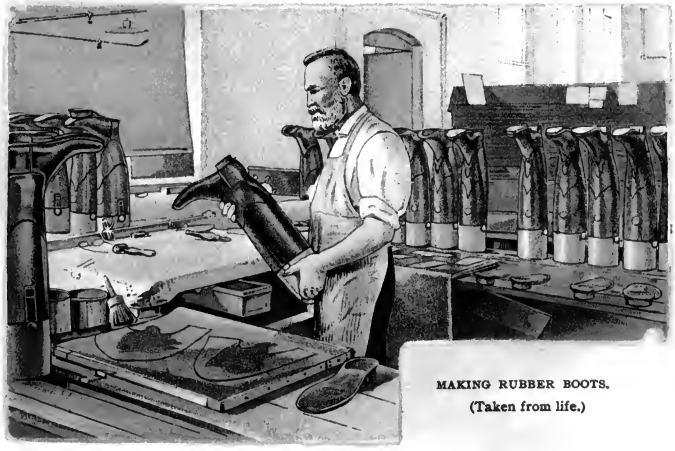
The cutter takes the sheets of rubber cloth and with tin patterns cuts out the various pieces for the different styles of boots and shoes.

The makers next take the different pieces and put them together, forming the boot or shoe over wooden lasts, without a stitch or a tack, as all



CUTTERS AT WORK.

the overlapping edges are adhesive and, when once rolled down firmly with a hand-roller to force out the bubbles of air which might cause a blister later on, they are taken to the varnishers, who, surrounding a small, square table with a large pan in the centre, dip their brushes into the

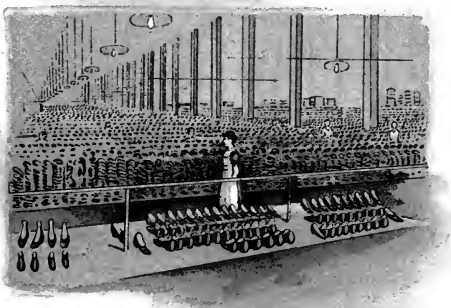


MAKING RUBBER BOOTS.
(Taken from life.)

VARNISHERS.

pan and apply a coating to the shoes.

Placed on iron cars, they are propelled along an iron track into a huge oven, where the temperature is about 300°. A confinement of many hours is required to accomplish the vulcanizing process, which is the most delicate and troublesome process of all, for if the temperature should reach a few degrees too high or fall a few degrees too low, on a single "batch," thousands of dollars worth of rubber boots and shoes would be rendered practically worthless. The goods are next



PACKING ROOM.

sent to the inspectors, packers and shippers, to reappear later in a tempting array in the local shoe stores in every part of the United States.

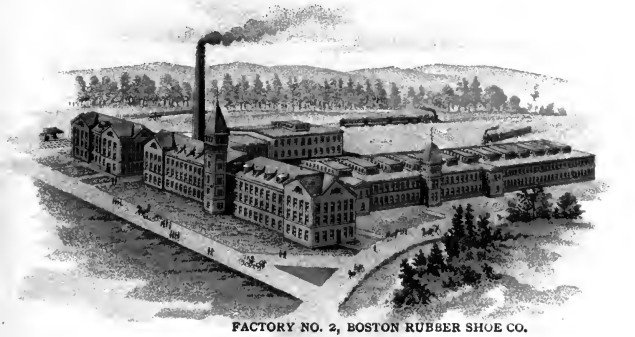
This is only a hurried and brief sketch of the various operations which at every stage require skilled labor, sagacious supervision and the use of the highest grade of material. There are rubber shoes and rubber shoes, of course, but the rubber shoe that looks well and wears well is the result of not only the most conscientious labor and long experience, but of the investment of enormous capital. Such a shoe is that of the Boston Rubber Shoe Company!

STYLES OF 1857.

No other rubber company in the world has the connections and influence in securing the highest quality of raw material, the facilities and capacity for

manufacturing it and the confidence of the public in buying the finished product that the Boston Rubber Shoe Company has earned and established in the thirty-seven years that it has devoted to developing this industry; so when you buy a pair of rubber boots or overshoes insist upon having those with this stamp on the bottom, for they are the best that can be made.

In the group of factories owned by that Company many things are combined to secure preëminence. The buildings themselves were built solely for the purpose for which they are now used. The arrangements of light, heat and ventilation—all important factors in a business of this kind—are perfect. Everything per-



FACTORY NO. 2, BOSTON RUBBER SHOE CO.

taining to the manufacture of a rubber shoe is carried on under the Company's own roofs. Even the dyeing of the cloth linings, an apparently insignificant item, is so large with it that it dyes all its own goods on its own premises. Railroad trains run into its own yards, and every facility is offered for the quick handling of what is undoubtedly the largest business of its kind in the world. This great concern manufactures nearly forty-five thousand pairs of boots and shoes per day, as we have said, which means that the product of a single week's work of its factories would be sufficient to shoe an army three times greater than Grant's at Shiloh —and that would take three days to pass a given point, marching two abreast. More than three thousand persons find employment there and receive every consideration to which conscientious employees are entitled. A library has been organized, in which helpful and interesting books

abound, a librarian selected from among themselves being in charge. A savings bank is provided, and habits of thrift greatly encouraged thereby. Neat little cottages are also owned by the Company, and these are rented at reasonable prices to the men with families.

Our friend of the fireside wakes up from his revery and finds a member of the family at his side.

"What are you dreaming about?" the newcomer inquires.

"A pair of rubber shoes," is the answer.

"A pair of rubber shoes! There's not much to think about in them."

"More than you suppose; listen,"—and the dreamer tells what he has seen "From the Forest to the Foot."

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